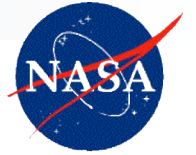


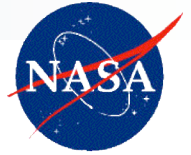
Software Engineering Research / Developer Collaborations

Tom Pressburger, Research Infusion Lead (ARC)
Ben Di Vito (LaRC), Martin Feather (JPL),
Michael Hinchey (GSFC), Lawrence Markosian (QSS Group,
ARC), Tim Menzies (Portland State Univ., IV&V), Luis Trevino
(MSFC)



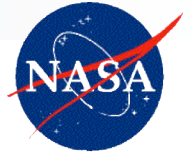
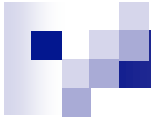
Outline

- Problem
- Hypothesis
- Approach
- Importance/Benefits
- Relevance to NASA
- Accomplishments
- Next Steps



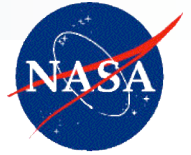
Problem

- State-of-the-art software engineering research required to meet NASA demands
- Tech transfer into NASA of Software Engineering Research difficulties:
 - Technology providers can't find customers
 - Software developers unaware of new technologies
 - Ignorance
 - Too many to evaluate
 - Developers can't afford up front costs and risks



Hypothesis

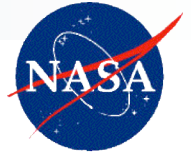
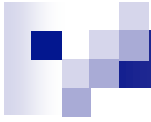
- Relatively small awards can overcome cost and risk of technology insertion
- Target innovators and early adopters
- Target technologies perceived as having low integration cost



Approach

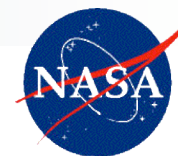
- Select several software engineering research products
 - Emphasis on those funded by NASA
 - Usefulness already demonstrated
 - Easy insertion
- Present them across NASA in hour-long Video Teleconference Presentation (ViTS)
 - Publicize using center-specific mechanisms and the Software Engineering Process Groups at each center.
- Solicit proposals from customers
- Fund pilot projects deploying the research
 - actual use, not a shadow project
 - competitively-selected





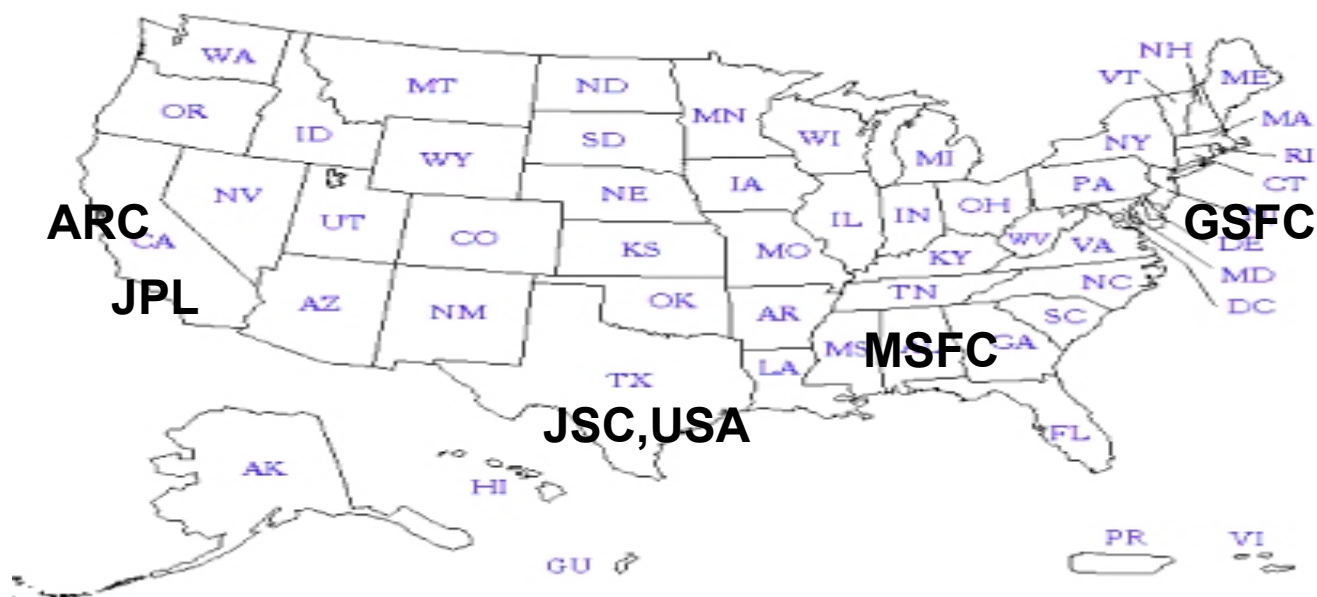
Importance/Benefits

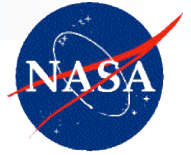
- Researchers now have testbeds, obtain feedback on
 - Efficacy
 - Deployment concerns
- Developers deploy new, valuable technology
 - Goal: incorporation of valuable technology into their practice
 - Goal: mechanisms for further migration identified



Relevance to NASA

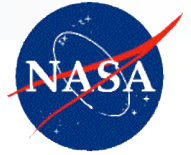
- Has historically been difficult for NASA-sponsored research to penetrate into actual NASA use.
- This is a new mechanism.





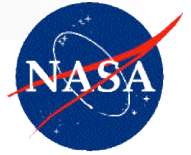
Accomplishments

- **For ViTS of 09/23/2003, 7 software engineering technologies were selected**
 - 5 NASA-funded research technologies
 - 2 commercial products
- **13 customer-initiated, high-quality proposals were submitted**
- **6 proposals were funded and initiated**
 - *C Static analyzers* applied to Station/Shuttle code (ARC,MSFC)
 - *Perspective-Based Reading* applied to flight project/Station code (GSFC, USA)
 - **Penetration 9!**
 - *Orthogonal-Defect Classification* applied to DSN antennae controller (JPL)
 - *Code browsing tool* applied to guidance code (JSC)
- **Funding**
 - SARP!
 - Substantial additional cofunding; *indicates researchers/projects are committed*
- **One completed, rest ongoing—results at this time to be presented.**



Accomplishments (contd)

- ViTS on 05/18/2004 showcasing 6 new technologies
 - Technologies tuned to reflect feedback from software developers who attended the first ViTS.
- 4 proposals submitted



Next Steps

- Reports on lessons learned deploying the technologies.
- On the lookout for
 - new research products to infuse.
 - new forums to reach developers to find...
 - new customers.
- **2005 time line**
 - Mid-**February** Technologies selected: RESEARCHERS!
 - Mid-**March** ViTS: CUSTOMERS!
 - Mid-**June** Collaboration proposals due: CUSTOMERS!
- Info:
 - <http://ic.arc.nasa.gov/researchinfusion>
 - tom.pressburger@nasa.gov